I may mention: Itching in 2 persons; other paraesthesiæ in 3; thirst in 4; neuralgia in 2; sore-throat in 2; Cheyne-Stokes respiration in 3.

HALLUCINATIONS IN THE INSANE.[1]

BY EDWARD B. LANE, M.D.,
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HALLUCINATIONS and kindred phenomena have, from the earliest times, made a profound impression on the human mind. They have awakened man's sense of awe and stimulated his curiosity. They have appealed to his fears and nourished his egotism. As is well known, they have contributed, in no small measure, to various religious beliefs, and they have exerted an influence in the affairs of nations. In recent times, hallucinations, like many other phenomena, have been subjected to critical study by the faithless materialism of our day, with the result that we are asked to regard all such as due to morbid cerebral action. This belief is, however, far from being universally adopted at present. The majority of people are yet inclined to look upon a vision as something uncanny, and prefer to believe the hallucinated as holding some occult relation to the supernatural world; unless, indeed, there is reason to believe one experiencing an hallucination to be insane. Fortunately to-day the spiritual theory of mental disease is all but obsolete. While men are willing to allow that hallucinations of the insane are subjective and pathological, they cling to the belief that hallucinations in the sane are a source of revelation from the spiritual world.

It is certain, however, that hallucinations of the senses are capable of being explained in physiological terms; also that they are a frequent symptom of various forms of mental disease, and in one form (paranoia), at least, it would appear that they are a constant symptom.

Yet, no one will deny that hallucinations occur independently of mental disease; although we may not call an hallucination physiological. How frequently they occur in the sane I am sorry to say I cannot tell. The census that is now being taken in this country has not been sufficiently analyzed. It will show probably that not far from ten per cent. of the adult population have had, at least, one hallucination. Whatever the result may be I think it will prove to be a surprisingly large one — allowing *liberally* for errors necessary to such a faulty method of collecting statistics.

For several years I have observed the acute cases of insanity coming under my notice, with especial reference to the presence or absence of hallucinations. It is the statistical results of such analysis that I have ventured to present to you to-night. I shall await with much interest the analysis of the census of hallucinations among the sane. Perhaps not until they are published will the results of the small number presented here be of much significance.

It is not my purpose to discuss the nature or origin of hallucinations, whether in the sane or insane — but by way of explanation, I will simply state that I regard all hallucinations as the result of perverted action of the sensory regions of the cerebral cortex — thus closely allied to the function of memory and the phenomena of dreams.

[1] Read before the Boston Medico-Psychological Society, March 19, 1891.

The almost inevitable result of an hallucination, whether in a sane or insane person, is a delusion. This will not be an *insane* delusion necessarily. Such delusions are, first, an explanation of the false perception itself and this explanation varies with the past experience of the individual, his education and beliefs — secondly, in the insane, delusions regarding the supposed author of the apparition or voice.

The writer has long had a theory that the prevalence of hallucinations in the sane explained the growth of the delusion (as he regards it) of spiritualism in this community.

There is a large clientèle of victims of occasional false hearing, or false sight, who grasp with eagerness any explanation of their experience which coincides with their previous education, and, at the same time, tends to increase their own importance.

It is customary in hospitals to speak of a patient becoming insane through spiritualism. I prefer to believe that spiritualism is the result of hallucinations, and that insanity would have been very likely to occur even though the theory of spiritualism had not been previously accepted.

The relation of hallucinations to delusions is a very intimate one, and is very important in the study of insanity. Delusions are found in the insane who have not experienced hallucinations — more especially is this true in acute mania and general paralysis, for in these diseases the characteristic delusions are less apt to be based on hallucinations. In paranoia, on the other hand, the delusions are, in most cases, the direct outcome of hallucinations. In many cases of melancholia, also, the depression is increased by the hallucinations, though both hallucinations and delusions are secondary to the sense of depression. In this affection, however, the hallucinations appear to give rise to a great variety of secondary or superimposed delusions.

While this paper is devoted to the subject of hallucinations it is necessary to explain that I have found great difficulty, practically, in differentiating hallucinations and illusions in the insane. Clearly marked illusions I found rather rare. Yet, in the case of certain senses, it must be admitted that it is almost impossible to say that a given experience is not an illusion. We can verify the patient's story when he claims to see a face in the dark or hear the voices when all is quiet. But, if he says he felt a hand, it is clearly impossible for the observer to be sure there was no external irritation. This difficulty obtains as well in the senses of smell and taste. The patient says he tastes arsenic in his food. He is eating, and various substances are being perceived by their smell and taste. Still more is this true of visceral hallucinations, as we cannot assert the patient may not be subject to various sensations which he misinterprets.

Because of the impossibility of accurately distinguishing illusions from hallucinations I have considered them all as hallucinations.

Physiologically, the two symptoms are so much alike I think the distinction a very unimportant one in this connection. Yet the few cases where the trouble was clearly illusions of sight and hearing, unaccompanied by hallucinations, have not been considered in the statistics presented.

Nor have I attempted to tabulate all the cases of insanity seen. The cases presented are a small fraction of those seen by me, but believing a few hundred cases carefully analyzed would be much more valuable

for statistics than a larger number poorly studied, I have limited myself to those cases where I could get a fair history, or have observed the case long enough myself to make a diagnosis. I have also rejected many doubtful cases. As shown by the table presented I have rejected all cases of secondary delusional insanity and secondary dementia, for various reasons, chiefly because the acute forms of mental disease are more profitable to study, and the secondary conditions are in no proper sense forms of mental disease, no more than the wrecks along the beach are to be classed as a special form of ocean craft.

As shown by the table the total number of cases studied is 307.

HALLUCINATIONS.

	Hearing alone.	Sight alone.	Smell or Taste.	Hearing and Sight.	Hearing, Sight and Smell.	Hearing and Touch.	Hearing, Sight and Touch.	Sight and Smell.	None.	Total.
Paranoia,	38	1	1	18	5	2	1	1		67
Acute melancholia,	32	5		9	4				5	55
Acute mania,	15			3					20	38
General paralysis,	9	2	1	3					19	34
Post-paralytic insanity.		1		2					7	10
Other Organic brain disease,	3			2	1*					6
Epileptic Insanity,	4	4								8
Insanity of pubescence,	4			2					5	11
Katatonia,	2			2						4
Hysterical insanity,				1					5	6
Senile insanity,	6	5		2					16	29
Alcoholic insanity,		1		2						3
Recurrent mania,				1					3	4
Folie de doute,	1									1
Simple mania,									2	2
Simple melancholia,									10	10
Folie circulaire,									7	7
Senile dementia,									6	6
	114	19	2	47	10	2	1	1	111	307

* And Touch.

PARANOIA.

Out of 67 cases of paranoia there were none who did not at some time have hallucinations, and in only three of this number were hallucinations of hearing not found. In one of these cases hallucinations of sight and of smell or taste were very constant. He was inclined to talk much about his delusions, but I never could get any evidence of hallucinations of hearing, and I think it very doubtful if he had them. In the other two I cannot feel sure that they may not have existed and were not noticed. Neither of these cases were inclined to talk about themselves.

It would appear from this that not only are hallucinations to be expected in all cases of paranoia, but that the absence of auditory hallucinations is rare. I have heard old asylum attendants say that false hearing was a bad sign. I think this observation due to the bad prognosis in paranoia, and the more or less continuous presence of this symptom during the course of this disease.

Hallucinations of hearing unaccompanied by those of the other senses, occurred in 38 cases, or considerably more than half. Hallucinations of sight and hearing in 19 cases — and also in five more cases in which hallucinations of smell (or taste) were present in addition.

In one case there were hallucinations of sight alone. In one case only hallucinations of smell or taste occurred alone. In two cases hallucinations of hearing were accompanied by tactile and visceral hallucinations or illusions.

To summarize — Hallucinations of one sense only were noted in forty cases; of two or more senses, in twenty-seven cases.

ACUTE MELANCHOLIA.

Out of 55 cases of acute melancholia (excluding simple melancholia) in 50, or a little more than 90 per cent. were hallucinations a symptom. Here, as in paranoia, hallucinations of hearing preponderate, for in only five of the 50 hallucinated cases did they fail to be noted. In 18 cases there were hallucinations of sight, in five of which this symptom occurred alone, in the others with false hearing. In four cases three senses were involved; namely, sight, hearing and smell or taste. In no case did I note hallucinations of smell or taste alone.

ACUTE MANIA.

In acute mania, hallucinations were less frequent than in the two diseases just considered. Out of 38 cases, 20, or a little more than half, gave no evidence of hallucinations. In the 18 cases where they were found, those of hearing were present in every one; in three cases hallucinations of sight occurred as well. Other senses were not affected.

GENERAL PARALYSIS.

This symptom was present in 15 out of 34 cases of general paralysis.

Hallucinations of hearing are again more frequent, being present in 12 cases (in nine alone, in three with visual). Those of sight were noted in five cases, and of smell or taste in only one, and then without those of other senses. In these rather few cases hallucinations were not a continuous symptom, but appeared transiently and rather in the first stage.

OTHER DISEASES.

Hallucinations were present in three of ten cases of post-paralytic insanity, and in all of six other cases of organic brain disease. Grouping them together we find this symptom in nine of 16 cases; auditory in eight, and visual in six. In one of these cases was noticed what is unique in this series, hallucinations of four senses: namely, hearing, sight, smell and touch. This series includes eleven cases of insanity of pubescence, in six of which hallucinations of hearing were observed, and in two of the latter those of sight occurred also.

In considering epilepsy I have not tabulated all the epileptics seen in the hospitals, but have taken merely those cases in which there was decided mental alienation. Out of 14 such cases hallucinations were present in eight. In these few cases hallucinations of more than one sense in the same case were not found. Four cases had auditory, and four visual, hallucinations.

Hallucinations of hearing were present in all the four cases of katatonia, two of which had visual hallucinations as well.

I fear my experience in hysterical insanity has been exceptional, as I have noted hallucinations as present in only one of six cases. In this case there were both visual and auditory hallucinations.

There are 29 cases tabulated as senile insanity. Here rather less than half (namely 13), experienced hallucinations. Eight of these had auditory, and seven visual, hallucinations. As will be seen the two forms of hallucination occurred together in two instances.

In classifying this series of cases, three cases were found in which the mental disturbance was so clearly due to alcoholic excess, and the cases could not easily be put in any other group here mentioned, that I have called them alcoholic insanity. As was to be expected, they all had hallucinations. More than this, all three had hallucinations of sight, — two had auditory as well, and one of them complained of various visceral sensations in addition.

In order to determine what part, if any, abuse of alcohol played in causing hallucinations in mental disease, aside from delirium tremens, I have grouped for study those cases in this series where there was marked alcoholic excess. There are eighteen such in addition to the three mentioned. Out of these 21 cases, in only four were there no hallucinations. Of the 17 cases where the symptom was present, only two failed to have false hearing, and they had visual hallucination. Nine had auditory hallucinations alone; six had auditory and visual, of whom three had olfactory as well. I am aware the cases are too few from which to draw valuable deductions. But, as far as they go, they fail to show that hallucinations are much more common in alcoholic subjects. But it does appear that visual hallucinations are relatively more frequent in alcoholic cases.

There are four cases of recurrent mania, a periodic insanity, one of the degenerative psychoses, — hence they are not included under the head of acute mania; only one of these had hallucinations. Only one case of folie du doute appears. Hallucinations of hearing were present. Twenty-five cases yet remain to be examined. In these no hallucinations were observed. They are classified as: Two cases simple mania; 10 cases simple melancholia; 7 cases folie circulaire; 6 cases senile dementia. Thus, taking cases as they come from this series, it appears that 63.87% have at some time hallucinations of some sense, and 36.13% have no hallucinations.

Excluding the diseases in which we found no hallucinations, let us consider the 282 cases of diseases in which hallucinations may be expected to occur.

	No. Cases.	Per Cent.
Hallucinations present	196	70
" absent	86	30
" of hearing . . .	175	62
" of other senses without auditory hallnc. .	21	8
" of sight . . .	77	27.3
" of smell or taste . .	13	4.6
" of touch . . .	4	1.5
" of viscera . . .	9	3.2*
" of sense of equilibrium,	3	1*

* This symptom is not indicated in the table, as it would have made it undesirably complicated. The cases in which they occurred, however, are all tabulated as hallucinations of other sorts occurred in them.

There are nine cases in which anomalous visceral sensations were complained of, which I believe to be analogous to hallucinations. It must be admitted, however, that such cases are often found to have serious lesions, which may give rise to unusual sensations. For example, a woman who claimed to feel a number of animals (ferrets, worms and leeches) in her body, was found to have a bony tumor on the ileum.

In three cases, at least, there appeared to be an hallucination of the sense of equilibrium. I have seen this in one other case, not included in this series. While it might be claimed that the sensation of vertigo, not caused by a previous oscillation or rotation of the body, was strictly an hallucination of the sense of equilibrium, the examples referred to me do not refer to the feeling of vertigo, strictly speaking. One of them, to use her own words, complained of a spinning sensation. I have suspected this condition to exist in the case of an epileptic patient, who, several times when delirious, believed himself to be aboard a moving train. In the case not included in the three tabulated here, a man had the delusion he was aboard ship, but he confessed to feeling the motion of the vessel. It is remarkable that this disturbance is not much more frequent, as it is so very common in our dreams, — almost universal, I should say, — to experience the feeling of falling rapidly just before waking.

In one case only have I noted what might be an hallucination of the muscular sense. In this case a man complained that his arm felt tired in the morning from the weight of his wife (who had been dead for some time). But as this is capable of another explanation, I do not care to cite it as a clear case of muscular hallucination.

Tamburini has recently published several very interesting cases of hallucination of the muscular sense. It is now all but universally admitted by psychologists that there is a muscular sense. If so, why may we not find hallucinations of such a sense? The cases reported by Séglas and Tamburini are, without question, to be considered muscular hallucinations. It is an interesting fact, that in all their cases the hallucinations were referred to the vocalizing organs. So, too, in the vast majority of auditory hallucinations, it is "voices" that are heard.

It appears that it is these sensory images most used in thought that are most likely to be revived as hallucinations during perverted cerebral action.

From a study of the subject of aphasia it appeared to the writer that the majority of men think in auditory rather than other images. It would be out of place to present the reasons for this conclusion here; but I desire to call attention to what appears to me to be a very significant fact. The preponderance of hallucinations of the sense of hearing over those of other senses is due, I believe, to more than accident. It is due to the physiological law of thought, if I may be allowed the term. As a rule, we are inclined to think in auditory images. Certainly the child who has not learned to talk, but understands what is said to him, must think in auditory images so far as names go. This early training must do much toward forming a habit of thought in auditory images; and by the usual methods of instruction other images acquired in the use of language are superimposed on the auditory.

In this connection it is interesting to note that the commonest answer received to the questions sent out for the census of hallucinations is, "I heard my name

called." And although I have not analyzed these cases with reference to the matter of the hallucination, and have therefore no figures, my impression that hearing the name called, or being "called out of one's name," as our Irish patients say, are the commonest experiences with the insane.

If an hallucination be simply the revival of a past sensory impression, why may we not have an hallucination of a painful sensation? This is almost impossible to affirm in a given case; but I can see no reason, *a priori*, why such an hallucination may not exist. A feeling of pain referred to an amputated member need not be regarded as an hallucination, however, for an irritation of the stump might cause a true pain, which by an error of judgment would be associated with the lost part.

I was interested in Dr. Prince's paper, read before the Society this winter, on the subject of hysterical pains. He offered an explanation that they were due to an association process. If I understood him, it would seem as though that were an hallucination, the idea or memory of pain being so thoroughly recalled as to make the patient project the sensation to the affected part. Unfortunately, pain is purely subjective, and we can but theorize on its reality when claimed by others.

In studying the table presented, it is evident that the ratio of auditory to visual hallucinations varies considerably in different diseases. It occurred to me to contrast two groups with reference to this point. In the first group let us put mania melancholia and paranoia, a total of 160 cases. In this group we find auditory hallucinations in 127, or 79 per cent. of cases, and visual in 47 cases, or 29 per cent. In the second group let us put these diseases where we would expect more gross anatomical lesions, namely, general paralysis, organic brain disease, epilepsy and alcoholic insanity, — making a total of 61 cases. Here we find auditory hallucinations in 26 cases or 44 per cent., and visual in 18 cases or 22 per cent. Thus while there appears to be a falling off of visual hallucinations there is a much greater one in the auditory; and in the latter group visual hallucinations are (relative to the auditory symptom) much more frequent.

Does not the fact that auditory hallucinations are more frequent in the psychoses than in organic brain disease lend support to the view that auditory images are more necessary to thought than others? On assuming this view to be the true one and reasoning *a priori*, ought we not to expect that auditory images would be more readily aroused in these diseases where perverted mental action was an important feature? And in those diseases following coarser organic lesions might we not expect the various sensory regions to be more equally irritated and senses other than the auditory to be represented in hallucinations.

It would be interesting to compare such statistics with similar ones as regards dreaming.

The distinction between hallucinations and pseudo-hallucinations has been made recently. I need not explain that the latter refers to those hallucinations whose subjective character is recognized by the percipient.

As pseudo-hallucinations are much less apt to be followed by delusions and insanity, the question is at once suggested might not a previous education in the subject of hallucinations, illusions, etc., prevent in many cases the serious consequences of hallucinations now seen in many uneducated people.

I believe there are a considerable number of cases sent to asylums yearly where the whole trouble is based on the continuation of the distressing symptom of false hearing; which cases would under proper care — if they had previously been taught that such experiences are very common — have made a rapid recovery at home. On the other hand, I know there are cases where pseudo-hallucinations persist so long, and are so disgusting or harassing that the patient in time becomes a victim of melancholia. Nor is it likely that the degenerative psychoses would be affected permanently by the knowledge that hallucinations are subjective.

Clinical Department.

SHOCK FROM AN ELECTRIC WIRE.

BY F. W. JACKSON, M.D., WESTON, MASS.

P. R., of Weston, age twenty-two, weight 150 lbs., a well-developed, muscular fellow, while driving home from Waltham, Saturday night, August 3d, had an encounter with a "live electric-light wire." His horse's feet became entangled in a wire that had broken away from its pole connection and fallen across the street.

The horse finally extricated himself from the wire, and in so doing removed some of the insulating material, in sections of one inch, — two or three in all. R., in his attempts to remove the wire, probably seized it at one of the unprotected points, thus forming a perfect circuit. He was immediately thrown a distance of ten feet against the curb-stone, and then instantly to the middle of the street again, swaying back and forth three times. His hands were in contact with the wire about three minutes, when, from some unknown cause, the current suddenly broke, and he dropped to the ground unconscious, remaining so about ten minutes, then in a semi-conscious state fifteen minutes, after which was removed to my office.

I first saw him two hours after accident. Pulse 100, strong and bounding; temperature 100°; pupils dilated; headache; nervous and irritable; reflexes increased. Headache accompanied by insomnia continued for three days, after which time rapidly disappeared, and he resumed his work as railroad section-hand without any inconvenience, apparently none the worse from the shock. The palmar surfaces of both hands and arms were blackened from tips of fingers to a point midway between wrists and elbows, and were sensitive to touch, and on the least irritation the muscles would violently contract — disappearing on the second day.

Two days after accident the company's agent effected a settlement with him, which did in no way modify the convalescence, as he was totally ignorant of the results of coming in contact with a "live electric-wire," or electricity in any form.

The current was from a fifty-light Thomson-Houston arc machine, ampère current 6.8; the voltage was about 2,100 on that circuit at that time, it being a new three-braided electric-light wire, did not consequently allow the electric current to escape through. It being a wet night and raining heavily at the time, was undoubtedly the cause of his sustaining such a severe shock. The voltage passing through his body is wholly problematical; and it is my opinion that, had he been